WHITE. (JAS. C.)

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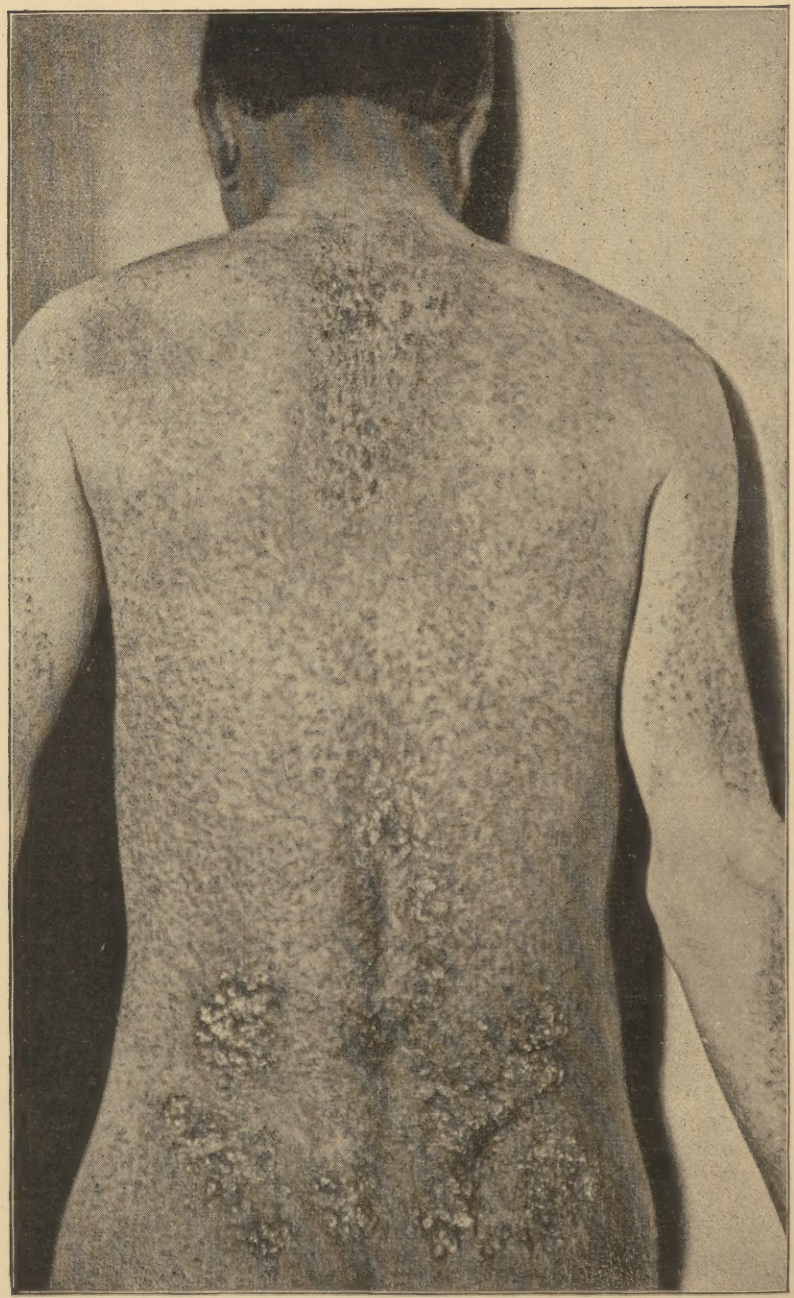
REPRINTED FROM THE JOURNAL OF CUTANEOUS AND GENITO-URINARY DISEASES FOR JUNE, 1889.



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# A CASE OF KERATOSIS (ICHTHYOSIS) FOLLICULARIS.



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THERE appeared lately at the clinic for cutaneous diseases at the Massachusetts General Hospital a patient whose skin presented the following extraordinary manifestations: The whole surface, with the exception of the palms and soles, the genitals, and some portions of the flexor aspects of the arms, was thickly occupied by a variety of lesions, which may be thus analyzed:

1. Minute papules, the size of a small pin's head, smooth, firm, and not differing in color from the surrounding skin.

2. Papules somewhat larger than the above and slightly hyperæmic in appearance.

Lesions 1 and 2 closely resemble those of keratosis pilaris, but are, perhaps, not so sharply conical as the latter often are.

3. Still larger papules, of flattened hemispherical shape, with smooth or polished, dense coverings of nail-like consistence, and varying in color from dull-red to purplish, dusky-red, brown, and brownish-black. At a little distance they strongly resemble the lesions of lichen planus. The tips of some of them have been excoriated by scratching and are covered by hæmorrhagic crusts.

All of the above three forms are discrete and are surrounded by apparently normal skin.

4. Extensive elevated areas formed by confluence of the above lesions, presenting uneven surfaces, covered by thick, yellowish or brownish, flattened, horny concretions.

5. Elongated, horny masses, from one half to one third of an inch in diameter, and from one eighth to half an inch in height, of irregular out-

line, with blunt, truncated apices, yellowish in color, of dense consistence, and compactly crowded. They may be removed with little difficulty, and then show bases of corresponding area, considerably elevated above the general surface, hyperæmic, and moist.

All these lesions thickly occupy the trunk and limbs, with the exception of some portion of the inner surfaces of the arms. The smaller discrete papules are distributed over the flanks and lateral thoracic regions, the flexor surfaces of the arms, and some parts of the legs. The larger forms, and the uniform areas made by confluence of the same, occupy extensive tracts upon the extensor portions of the arms, the anterior and posterior aspects of the trunk, and nearly the entire lower extremities. On the lower legs they form thick plates, completely encircling the limb, broken by deep fissures and shallow ulcerations. The most prominent horny prolongations are seated upon the median spaces of the trunk, front and back, and are most pronounced over the sternum and pubes. See accompanying plate from a photograph by Mr. Chadbourne, medical house pupil.

6. Smooth, flattened, blackish, elevated plates, forming a continuous covering upon the backs of the feet, and resembling the condition called, by some French writers, *ichthyose noire cornée* (*vide* Baretta's model No. 4).

7. Enormously dilated follicular openings, distended apparently by firm, slightly projecting concretions, forming hemispherical elevations. These occupy nearly the whole surface of the upper parts of the face.

8. Small, sharply pointed, conical horns, curved at the tip, protruding an eighth of an inch from a few of the above distended follicles. These are situated below the eyes.

9. A few large circular elevations with blind central depressions, nearly half an inch in diameter, closely resembling a crateriform epithelioma, seated upon the temples.

10. Large papilloma-like excrescences, almost fungoid in appearance, nearly filling up the space behind the ears, and separated from each other by deep fissures.

Upon the scalp are some sparsely scattered, medium-sized, firm elevations. The hair growth is everywhere normal. The integument of the palms, soles, and genitals is but little changed from its natural condition. The nails are coarse, slightly thickened, and jagged at their free edges. A few firm, small, papular projections are seen upon the hard palate.

The skin is nowhere oversensitive or painful on pressure, excepting about the ulcers upon the lower legs. There is a nearly universal pruritus, which leads to almost incessant violent scratching, in consequence of which the horny elevations are frequently torn away, to be in turn slowly reproduced. An intolerable stench is given off by the patient, especially

from the lower legs, characteristic of decomposing epithelium. The clothes are saturated with it.

The patient gives the following account of himself: He is an American, forty-nine years old. His parents and an older brother are in good health. None of his family are known to have had any cutaneous disease. His skin was always natural until after entering the army in 1862, at the age of twenty-two. He underwent the usual inspection on enlistment, and no marked disorder, at least of the skin, was noted. The first sign of the affection observed by him was the appearance of "a rash" upon the shoulders beneath the knapsack after a long march. He says that it looked then like the smallest lesions now present. During the following two or three years "it spread a good deal" upon the trunk, but "no crusts appeared upon the pimples" until after this period, and then they began to form upon the back and front chest. Two or three years later the limbs began to be affected. Since that time there has been a gradual extension of the lesions over the whole integument, with progressive changes in character up to the present time.

The patient's general health has always been good, although suffering much throughout the disease from itching, and in later years also from the ulcerations upon the lower legs. The horrible odor emanating from the skin has lately kept him from free intercourse with his fellow-men.

What disease do all these extraordinary and multiple manifestations represent? It is easy to trace the intimate connection between the various lesions by their progressive development from the minute primary papule to the largest masses of horn-like concretion. At the beginning of the process we have lesions in no way to be distinguished from those of simple keratosis (lichen) pilaris, while the other extreme is characterized by formations resembling well-marked ichthyosis cornea. The disease is then, evidently, in all its phases a keratosis, or primarily a hypertrophy, or modified cornification of the epithelial layers. It is also evident that its starting-point is in or about the follicular openings. To determine the precise nature of the anatomical changes in the cutaneous tissues, specimens of the lesions representing various stages of development were removed by my friend, Dr. John T. Bowen, by means of the cutaneous punch of Dr. Mixter, and submitted to most careful microscopic examination. The processes employed and the results obtained are detailed by him in the following report:

"One of the horny concretions, nearly one centimetre in length, was removed from the abdomen, and two lesions were excised from the outer side of the upper arm, one of them a papule of less than miliary size, and chosen as representing the primary stage. Besides these, there was excised from the cheek, just below the eye, a well-developed lesion from which protruded a horn, about five millimetres in length and slightly curved at the end.

"The specimens were hardened in alcohol and cut in celloidine, with

the exception of the larger lesion from the arm, which was imbedded in paraffine.

"The horn removed from the abdomen was shown, in sections stained for some time in picrocarmine, to be made up of epithelial cells, arranged more or less regularly in vertical or oblique columns, with a nucleus sometimes colored by the carmine, sometimes not. In places the cell structure had become almost obliterated, bands of fibrous-looking tissue having taken its place. Here and there throughout the horn were scattered bodies of a concentric arrangement, similar to epithelial pearls, which took on a bright-yellow tint from the picric acid. The base of this horn was not examined.

"The larger lesions were cut in sections through the entire nodule. The sections were stained in picrocarmine, in hæmatoxyline and eosine, and in safranine to which aniline water had been added. The sections from the periphery of the lesion were noticeable chiefly from the prominence of the sebaceous glands. It could not be accurately determined whether or not they were increased in size, although it seemed probable that they were. They were perfectly normal in appearance. Advancing toward the center of the lesion, a proliferation and extension of the rete cells into the corium could be seen, and in the center the appearances were those represented in Fig. 1. The lesion described is the one taken from the cheek, and from which a horn five millimetres long protruded. The appearances were those of a pouch or sac, extending down into the corium, and separated, in its lower portion, into two subdivisions. Into this pouch extended the horn previously described, which had become detached from its base during the process of imbedding. The figure represents diagrammatically the portion of horn that protruded above the surface of the skin. The horny matter extended nearly to the bottom of the pouch, where the lower rete cells were enlarged and undergoing proliferation. Staining with hæmatoxyline and afterward treating with a one-per-cent. solution of hydrochloric acid, brought out very prominently the granules of the stratum granulosum, which were also well seen in the picrocarmine specimens. The increased breadth of this layer, the large size, and irregular, branched shape of these keratohyaline granules, as seen in the hæmatoxyline and picrocarmine specimens, taken in connection with the horny changes, suggested a careful investigation of the much-disputed keratohyaline-eleidin question, as illustrated by these pathological changes, but, unfortunately, the material was insufficient. At the periphery of the lesion a marked increase in the pigment in the normal rete cells was noticeable. The corium presented no features of pathological significance. The papillæ at the sides of the lesion were somewhat enlarged, and there was a moderate round-celled infiltration about the vessels. The sweat-glands were normal.

"From the two larger lesions no positive opinion could be reached as to the nature of this crypt or pouch in the corium from which the horn extended. Its shape suggested the enlarged orifice of a hair follicle, with

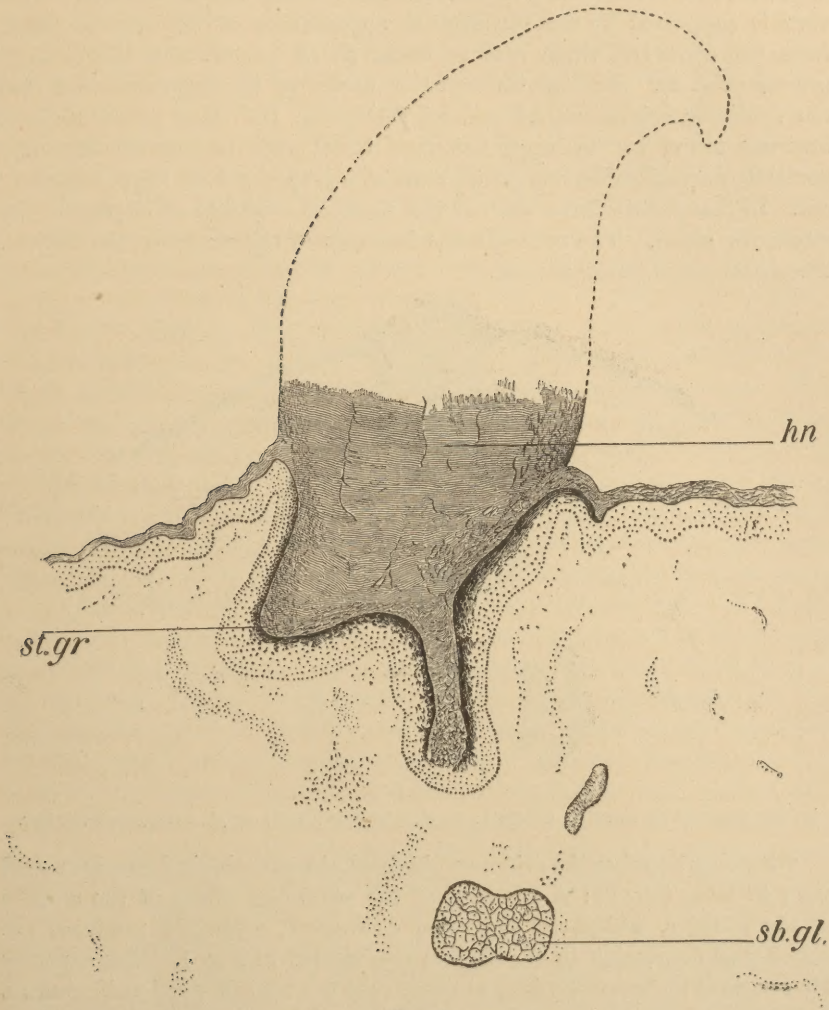


FIG. 1.

Hæmatoxyline. One per cent. HCl solution. Eosine. *hn*, horn, the upper part represented diagrammatically by the dotted outline; *st. gr.*, stratum granulosum. Kerato-hyaline granules deeply stained by the hæmatoxyline. *sb. gl.*, sebaceous gland.

the possible implication of a sebaceous gland. The contents, as I have said, were of a purely horny nature, at least so far as the microscope could be relied on to determine this question. No fat-drops or *débris*, so char-

acteristic of comedo, could be detected. Moreover, the sebaceous glands were found in large numbers at the side of and below the lesion, giving one the impression that they had been pushed aside and downward by the keratosis and proliferation of the epithelial lining of the follicles. This view is supported by the histological appearances of the minute lesion from the shoulder, which may be taken as an exponent of the primary process (Fig. 2). Sections through the center of the papule showed that the follicular orifice was dilated and filled with the same horny material that was found in the larger lesions. Below could be seen the duct of a perfectly normal sebaceous gland, and still deeper a hair shaft, obliquely cut. In this papule there was not the slightest evidence of change in the sebaceous gland. The process was a keratosis of the mouth of the follicle. The sweat-glands were normal.

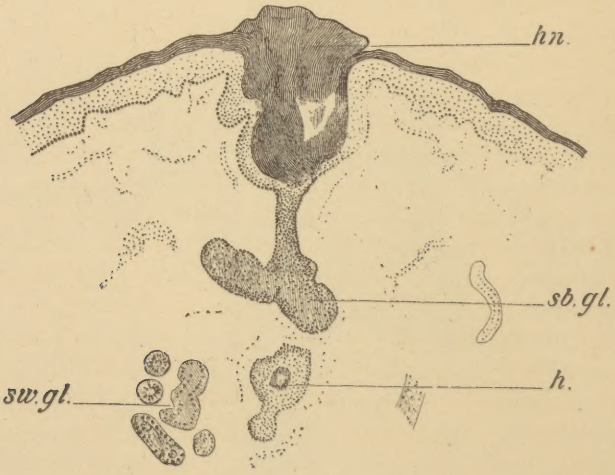


FIG. 2.

*hn*, horny mass in the mouth of a follicle; *sb. gl.*, sebaceous gland; *sw. gl.*, sweat glands; *h*, hair.

"Putting together the evidence obtained, the pathological process would seem to be as follows: A keratosis of the epithelial lining of the mouths of the follicles, which, by extension downward, gradually produces the pouch-like depression in the corium represented in Fig. 1. The capacity for corneous metamorphosis is so great that the central portion becomes a firm horn, which, by increasing production of horny matter from below, is gradually pushed out above the surface of the skin. There was no proof that the sebaceous glands were ever affected by the horny change. The three lesions examined would go to show that they are rather pushed down and out of the way by the increasing horny growth in the follicles. On this point, however, the reservation warranted by the small number of lesions examined must be claimed."

It appears, then, that the process begins, as the gross appearances indicate, by changes in the funnel-shaped mouths of the hair follicles, which are apparently identical with those found in keratosis pilaris. It suggests, too, at this stage, the cacotrophia folliculorum of Tilbury Fox.* The larger discrete lesions, especially those upon the face, strongly resemble Dr. Morrow's description of the appearances in the case reported by him under the title keratosis follicularis.† The anatomical changes in the skin in that case, as given by Dr. Robinson, also seem to be of the same general character as found by Dr. Bowen in this case. But in Dr. Morrow's patient, a man twenty-one years of age, the lesions were uniformly papular and comedo-like, and had not progressed beyond such discrete manifestations after a duration of five years. The sebaceous system was also more implicated in the pathological changes than was apparent in this case.

If now we consider the most advanced lesions it presents, the prominent masses of horny concretions occupying large areas of the cutaneous surface, there can be no question that the only recognized dermatosis which presents similar appearances is ichthyosis hystrix or cornea. Yet the general picture of the disease and the character of the primary lesions do not suggest such a diagnosis. The commonly accepted definition of ichthyosis is a disease of the upper layers of the skin, which begins within two or three years after birth, and affects nearly the whole surface uniformly and continuously from the start, although the process becomes more pronounced after childhood, and is always more exaggerated in some parts, while other regions of small extent remain practically exempt. The characteristic phenomena from the beginning are dryness and scaliness over large continuous areas, and the tissue changes are uniform thickening of the epidermal layers with corresponding elongation of the papillæ. In this case the first manifestations are papular in character, and separated from each other by considerable interspaces of perfectly healthy skin. It is only by the slow enlargement of these primary lesions, and by their multiplication over such normal intervening spaces, that the whole surface of a given area becomes finally affected. But even then, although exhibiting far greater thickening and prominences than ordinary ichthyosis, it is never scaly. The minute anatomical changes, too, are wholly dissimilar. Instead of affecting the cutaneous tissues uniformly at first, they are confined within the openings of the hair and sebaceous follicles, and the surrounding epidermal and papillary layers are entirely normal. It is only by the enlargement of such individual centers that the skin as a whole becomes later involved. From such a typical ichthyosis it is evident that this case differs in every important respect.

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* Clinical Society's "Transactions," vol. xi.

† "Journal of Cut. and Ven. Diseases," September, 1886.

But there is another kind of ichthyosis, so called—a very different and much rarer affection—characterized by the formation of prominent horny concretions of various shapes, styled ichthyosis hystrix, or porcupine disease, and between such lesions and the most advanced manifestations in this case there is great similarity, or, it may be, actual identity. Several authors have called attention to the restriction of the cutaneous changes to the follicles in some forms of ichthyosis. Thus Kaposi states * that the earliest stage of ichthyosis may be the condition known as lichen pilaris. Lesser † speaks of the resemblance of ichthyosis to lichen pilaris, but holds that it differs from the latter in the greater degree of cornification of the epithelium, and calls it I. follicularis. He refers to Guibout's description of the affection under the title acne sebacea cornea, which he regards as a misnomer. Behrend ‡ describes a special form localized at the openings of the follicles under the name ichthyosis follicularis, and considers it to be identical with Fox's cacotrophia folliculorum.

These forms, however, all begin early in life, and do not establish by later developments any other ground of identity with the advanced lesions in our patient, or with those of the rare cases on record known as ichthyosis hystrix. Nor are exact data available covering the early history and mode of development of the latter, by which we may determine the points of resemblance of our case to them in the early stages. There can be no question, however, as to the intimate relation between them in the most advanced stages of development, both in anatomical features and gross appearances.

It may be, therefore, that this case is only an additional example of true ichthyosis hystrix, so called, of which but very few well-known instances are on record, and that the doubt or delay as to accepting such a diagnosis rests upon a want of knowledge on our part of the initial changes which characterize the latter. But if this be possibly the correct diagnosis, it establishes in my mind the conclusion that the title is wrong, and that the process we have been studying can not properly be called an ichthyosis. It is a wholly different affection from ordinary ichthyosis in the location of the primary process, in the character of its individual lesions and entire sequence of appearances from first to last, as well as in the history of its progress. If this indeed be an example of hystricismus, presenting, as it does, opportunity for the study of its anatomical characteristics in every stage of development, it suggests the adoption of the more appropriate names ichthyosis follicularis or keratosis follicularis.

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* "Pathol. und Therap. der Hautkrankheiten," p. 515.

† V. Ziemssen's "Handbuch der Hautkrankheiten," Bd. 1, p. 477.

‡ "Lehrbuch der Hautkrankheiten," zweit. Auflage, p. 337.